SECTION TWO

PREPARATION OF CAMERA-READY COPY

This consists of bringing together all the various pieces of the job that is to be printed and pasting them together in their correct order and position. It is generally known as paste-up or make-up.

All printing units that use offset litho will need some basic items of equipment for the make-up of paper (e.g. from typewriter setting) and film material (e.g. from phototype-setting).

All make-up operations should be carried out in consultation with (a) whoever makes the plates, (b) the pressman, (c) the binder. Make sure to choose the equipment that best meets your needs, in particular the volume of your work.

ILLUSTRATIONS

Choosing and preparing illustrations for reproduction must be done with great care. There are two styles of illustration: line and tone. Tone illustrations are usually photographs; line images are usually prepared by hand with pen and ink.

Whichever style is used, the procedure for producing illustrations is the same. Illustrations being prepared for a printing process must be drawn on good quality white paper with a smooth surface capable of taking pen and ink work without fluffing or spreading. The ink must be a good dense black to give the greatest contrast. Technical pens (see diagram 7) with changeable nibs are necessary for this work, and a good set of drawing instruments is a great asset.

The other form of illustration is the tonal image. This can be a photograph or a pen and ink drawing with a brush wash or a black and white painting.

Low-quality illustrations can be made by using a 35 mm camera. Medium-quality illustrations can be achieved with a plate-maker. But for high-quality half-tone illustrations a process camera is needed. (See Section 3)

Half-tone illustrations, produced with a process camera, demand the use of a 'screen'. This is a piece of film on which a number of parallel lines have been drawn with identical lines crossing them at right angles. The screen breaks up the photographic image into dots graduated in size according to the tone of the image. Screens are available in the following grades: 65 lines to the inch; 85 lines to the inch; 120 lines to the inch; and 133 lines to the inch. The higher the number of lines, the higher the quality of the printing paper that has to be used.

If you look through a magnifying glass at a photographic illustration in a book, magazine or newspaper, you will be able to see the dots created by the screen. Magnified even further they look like Diagram 5.
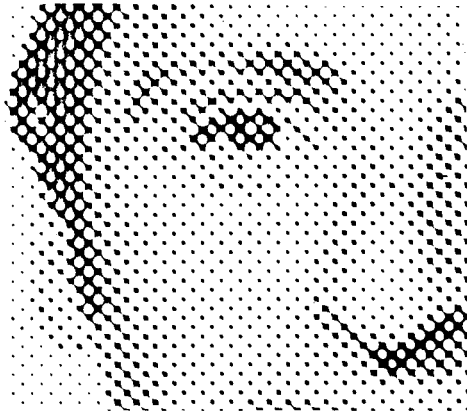

Diagram 5: Enlargement of part of a halftone

The best-quality results can only be achieved by using half-tone screens with a process camera. They are expensive to buy, delicate to handle, and difficult to use correctly. It

would take at least a week, possibly longer, to train an already proficient camera-operator in their use.

It may be possible to have the half-tone illustrations put on film by an outside concern. If such illustrations are seldom required, this would be the best and cheapest solution.

If no process camera is available, a cheaper but lower quality method is to make a (same size) screened bromide. This is done by taking the negative of the work to be printed and placing a half-tone screen (usually made of transparent plastic) above it and exposing it onto bromide paper. The result is a photograph with the half-tone screen on it. This can be done if ordinary photographic facilities are available in the printing unit. The photograph can then be treated as a line image and pasted up with the text in the normal way.

If half-tone illustrations are to be photographed in the unit and 'stripped' (this is the term used for cutting and joining film) into film later, it is as well to prepare for this at the artwork stage. This is carried out as follows:

1. The text is pasted onto the backing sheet in its correct position, leaving space where the half-tone illustration will appear.

2. Rectangles of black paper are cut to the size of the half-tone illustrations.

3. The black rectangles are pasted onto the artwork in the correct position. This will appear as a clear window in the negative film, behind which the half-tone negative can be glued.

If the illustrations are to be transferred to plates via a process camera and film, they can be drawn larger than the finished print. Artists often find this helpful for their work. But it is essential that the illustrations are drawn to scale. This means two things. First, if a drawing is being prepared at twice the required size, any line used in that drawing must be twice as long *and also twice as thick* as that wanted in the finished print. If you see a thin, spidery illustration in a publication, you can be reasonably sure that this requirement has been overlooked. Second, it

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means that all illustrations in one publication should be drawn to the same scale. Unless this is done, the process camera has to be adjusted for each individual illustration, which raises operating costs. Of course, if the illustrations are to be used with the text matter, and the artist has no objection, it is sensible to draw them to the correct size and paste them down at the artwork stage.

Line illustrations need not be original: they can also be obtained from other sources such as books, magazines, advertisements, etc, though the laws of copyright must be observed. Illustrations must be chosen with great care and the same consideration given to them as to original work (i.e., they must be of high contrast and cleanly printed). Any faults in the image will be exaggerated by the various photographic processes.

EQUIPMENT AND SUPPLIES FOR COPY PREPARATION

The Lightbox

A useful piece of equipment is the lightbox. It is possible to work with a home-made device consisting of a wooden box with a cold lightsource beneath a piece of frosted glass. Frosted glass is better than ordinary plain glass as it diffuses the light from below, spreading it evenly over the whole area of the glass. It can be a model designed to stand on a table and thus be reasonably portable, or it can have built-in legs to make it free-standing. It will make the operator's work easier if the box can be angled in some way, preferably so that it can be adjusted to suit the needs of the individual operator. At least one edge must be straight enough to enable a T-square to be used. This is the minimum requirement of a lightbox.

A very useful addition is parallel motion - that is cross and traverse beams which enable the equipment to be used for ruling grids (for use later as a base sheet for paste-up), or checking the work for squareness. Any work which is pasted up out of square (something which can easily happen if a grid is not used) will be embarrassingly obvious on the printed page.

If the lightbox being used does not have parallel motion and a vertical rule, then a T-square and set-square will be necessary for the operator to draw right-angles, etc. It is more difficult than it seems at first to use a T-square and set-square successfully on a lightbox. Formal training is not necessary but the operator will need some practice before attempting a job for printing.
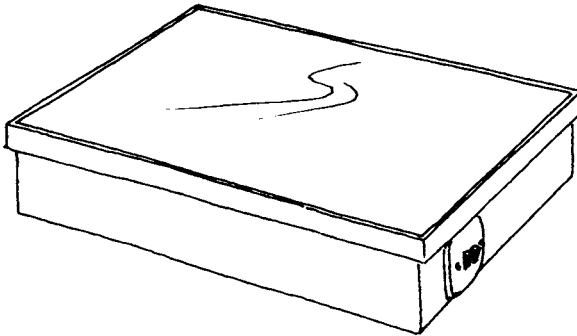

Diagram 6: A Lightbox

Adhesives

To augment the lightbox and assist in the assembly of art-work, other items of equipment are necessary. Whatever the nature of the work, rubber cement, a wax coater, or self-adhesive tape and sheets will be needed. It is best if all three are available.

Rubber Cement

This is the cheapest material for sticking down artwork. Its big advantage is that it does not dry immediately, so work can be easily removed and repositioned. It can be purchased one tin (or tube) at a time. All that is needed for its application is a spreader, usually made of non-rigid plastic. Also useful is a supply of waste paper on which to lay the paper being pasted up during application of the cement. If corrections have to be made to artwork after a period of time, it is possible to loosen the rubber cement by the care-ful application of cigarette-lighter fluid. The fluid must

be induced to run between the artwork and the backing sheet
and the artwork pulled gently away as the rubber cement dis-
solves.

If applied too generously, rubber cement will squeeze out
round the edges of the pasted-up pieces and pick up dust and
dirt. Time will be lost in either cleaning the artwork
before negative-making or in "spotting out" the finished
negatives (that is, covering with opaque liquid all the
small holes in the emulsion caused by black marks on the
artwork).

Wax Coating

This is probably the best form of adhesive. It is certainly
the cleanest, and allows removal and repositioning at almost
any time. The wax coating can be applied by a hand-held
machine (a waxer) which spreads a layer of wax 40 - 50 mm
(1½ - 2 inches) wide on the artwork. This is sufficient for
handling all the work of a small printing unit. For the
larger printing unit machines capable of applying wax to
paper of up to 500 mm (20 inches) in width are available.
These machines are semi-automatic with electrically-driven
rollers to pass the paper over the wax. All models of waxer
need an electrical supply. Electricity is necessary in the
hand-held model to melt the wax, and in the automatic machine
to melt the wax and drive the rollers. Little skill is
needed to use these machines, but the paper must be fed into
them correctly and the wax kept up to the right level.

Self-adhesive

Some material, such as that produced by headliners, comes
with self-adhesive backing. It is difficult to position this
with total accuracy and once in place it is impossible to
remove without damaging the backing sheet. Experienced op-
erators are therefore needed.

Headlines

Where typewriter setting is used the range of type sizes is
limited and headlines are difficult to distinguish from the
main body of the text. Other methods of producing headlines
are therefore necessary.

Lettering Guides

Lettering guides have certain advantages for a limited class
of work. A lettering guide consists of a plastic strip with
the various characters cut through. Any character can be
traced onto a piece of paper by pushing a technical pen (see
diagram 7) through the appropriate hole. The guides are
reasonably cheap and can be used by almost anyone with a
little practice. The drawback is the limitation of type-
styles, sizes and line thicknesses.

Diagram 7: Lettering guides and a technical pen

Rub-down Letters

A simple method of producing larger type sizes is with rub-
down lettering. It comes in sheets of alphabets and figures
of varying typefaces and sizes printed on a clear, thin
plastic sheet with a self-adhesive back. When a sheet is
placed on paper and pressure is applied to one of the charac-
ters, the character is transferred from its backing sheet to
the paper. The easiest way to apply pressure is with the
point of a soft pencil or crayon pressing down on the out-
line of the letter. The sizes of the letters are, like the
golfball composition typewriter faces, based on the printer's
point system. Probably the most useful sizes are 18, 24 and
36 point.

The small sizes are quite easy to press down, and guides are supplied on the sheet to enable the characters to be placed in straight lines. Difficulties arise when supplies are stored for long periods. Hairline cracks often appear on large typefaces, and these will be visible on the finished print unless filled in with black ink using a pen or a brush.

The sheets, which are quite expensive, tend to be wasteful because some characters are never used and others never seem to be available in sufficient quantity. Wastage can be reduced to some extent by purchasing as few different typefaces and sizes as possible.

The range of faces and sizes available is very wide and caters for exotic alphabets in addition to the more traditional designs. The sheets are produced with black or white characters and, in a few cases, in colour. As well as alphabets, an increasing number of sheets is being produced which enable the operator to lay down tints of various gradations, or which have mathematical, architectural or surveying signs. Diagram 8 shows some examples.

VWXYZabcdef
ghijklmnopqrstu

𝕽𝕾𝕿𝖀𝖁𝖂𝖃𝖄
𝖅abcdefghijklmno

MNOPQRSTUV
WXYZ abcdefg

Diagram 8: Examples of rub-down lettering

Letterpress 'repro'

Another way of obtaining display work is to purchase the word or words needed from an outside source. This could be a letterpress printer who would set the desired text in type and print it on any good quality white paper to give the best possible impression, a method known as "repro" (short for reproduction). This is as costly as obtaining the same material from a printer or typesetter who has a headlining machine, but the letterpress printer will be able to supply as many as half a dozen prints of the repro for the same cost, whereas there is only one print available from the headliner source.

Headliners

If large quantities of headlines are foreseen, a photoheadliner is the answer. The characters are on film sandwiched between two pieces of clear plastic.

Headliners come in two forms. These are:

    (a)   the strip headliner, and

    (b)   the circular headliner

The strip headliner is the most popular style of headliner in the printing industry. It operates from an image carrier that has the characters arranged in one or two rows along a strip of plastic. This image carrier is known as a strip negative. It contains the capital letters, small letters, figures and punctuation of one typeface in one size only. To be able to set a range of sizes, more strip negatives have to be purchased.

The popularity of this machine is due to its simplicity of operation and the fact that it can sometimes be used without a darkroom. The product is always a single line of typesetting that has to be pasted onto the work that is being prepared, either as camera copy or for platemaking. On some machines the exposure times are either calculated and set manually; on others the machine will calculate and set them automatically.

The circular headliner is a machine into which one of a range of discs can be fitted. Each disc has a particular typeface set around the edge. When a disc is fitted into the machine it can be rotated so that any of the characters can be aligned with a slot for printing.

Inside the machine is a paper strip made in two layers, the upper layer being a thin transparent film and the lower layer being the paper. Just below the strip is a carbon ribbon. When the required character on the disc is aligned with the slot in the machine, a button is depressed. This forces the character against the paper and the paper against the carbon. The result is an image of the character on the paper.

The strip of headline letters which comes out of the machine can be cut off by depressing a second button. The letters themselves can then be peeled off from the transparent film and pasted in position on the artwork.

The printing process is slow because only one character at a time can be printed. Changing of character size or type design needs the corresponding change of the disc. It is advisable to stock at least three different sizes of type, eg 18, 24 and 30 point.

The products of these machines are intended to be used as display lines for text matter that has been set by some other method. It is impossible to set justified lines of text with these machines. If justified display is needed, this must be done at the paste-up stage with each word being cut out and pasted down separately.

Other Equipment for Copy Preparation

Cutting tools

Sharp cutting tools are necessary for cutting and trimming paper and film. Razor blades will do, but a scalpel (of the kind surgeons use) with replaceable blades is safer.

Cutting surface

It is inadvisable to cut material on the lightbox as most glass will get scratched. An old metal offset litho plate,

gives a good clean edge to the cut though it tends to blunt the blade quite quickly. Alternatively an old piece of cardboard may be used. This tends to leave a "burr" (a slight roughening) on the cut edge but is much kinder to the scalpel blade. For a relatively small sum a cutting mat can be purchased which will enable the operator to get a clean edge to the work and will not blunt the blade so quickly. Cutting mats are made of plastic with a "self-healing" surface which lasts a long time. They come in a variety of sizes. For cutting complicated shapes, swivel knives are available but these really need to be used with one of the more expensive and sophisticated lightboxes.

Technical pens

These consist of a barrel, plus a number of hollow nibs of different sizes for drawing different widths of lines. (See diagram 7). Unscrewing one nib from the barrel and putting another in its place can be done quickly and easily. Because the nibs are delicate they should be handled carefully. Only the recommended ink should be used. An ink solvent is available to clean the fine ink channels in the nib should they become clogged with dried ink.

Opaquing liquid and red masking tape

These are needed for sticking negatives together and for "spotting out" unwanted dots. During the exposure of artwork to film in the process camera (see Section 3), any dust in the air interrupts the light and produces small, clear dots on the processed film. If left, these dots are transferred to the litho plate and eventually appear on the finished print. To get rid of them the film must be placed on the lightbox and all unwanted dots and other marks (for example paste-up marks) eliminated with either opaquing liquid or red masking tape. Where negatives have to be joined together, red masking tape is used (red being as impervious to light as black in this context) to prevent the light from penetrating the joins in the negatives.

Additional items

The operator will gradually build up a set of other items to meet his needs. It will probably include a T-square,

triangles, french curves, protractor, compass, dividers, bow instruments, a range of soft to hard pencils, erasers, scissors, steel rules, a hand guillotine or card cutter, masking or drafting tape, and cleaning tissues.